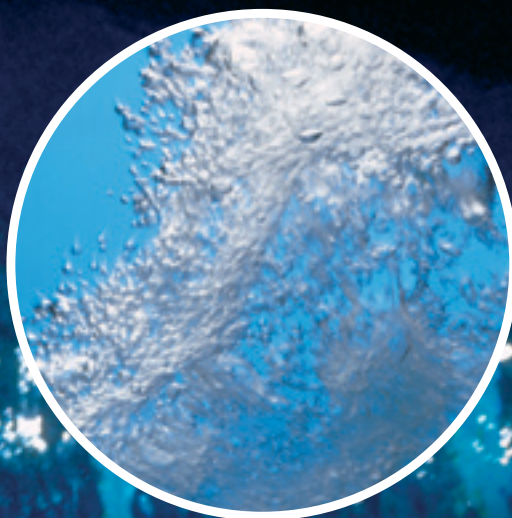


Intelligent Dosing Systems

Water Chemistry at the touch of a button



Uses Fuzzy Logic Technology



TEC3000 controller

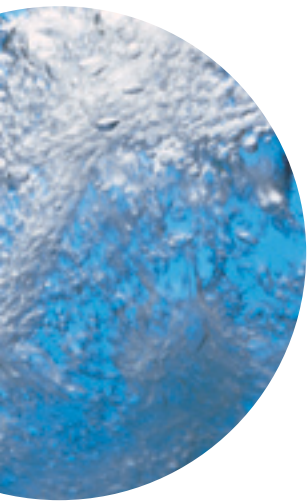
The TEC3000 dosing control system

The TEC 3000 is a unique and innovative intelligent chemical dosing system for the control of water quality in domestic and commercial swimming pools and spas.

The TEC3000: Main features

- System uses fuzzy logic to learn, adapt and control.
- Simple user interface.
- Automatic adjustment and calibration.
- Pre-programmed pool parameters.
- Advanced amperometric cell for increased accuracy and stability.
- Stops dosing under fault conditions.
- Controls pH and disinfection levels.
- Numerous options available

Manufactured in the UK



Intelligent Dosing Systems

The TEC3000: a revolutionary approach

The TEC3000 Control System is an intelligent controller designed to control the chlorine level and pH in domestic and commercial pools. The unit has the novel ability to learn and alter the dosing rates of a pool allowing the chemical set points to be maintained efficiently. The TEC 3000 is also equipped with a time base capability that can potentially anticipate regular events that may cause a rapid change in pool loading and compensate for them.

The TEC 3000 learns as it is used. The controller's software uses fuzzy logic to adjust its parameters according to the information given by its own sensors and software program. The operator just needs to know the values of the pH and disinfectant levels required for the pool to be maintained correctly.

The TEC3000 will do the rest.

As a matter of routine, the water in a swimming pool or spa must be manually sampled at regular intervals by the operator and tested to ascertain the chlorine and pH levels.



If the sample test values indicate a deviation from the desired level, the operator will take a confirmation sample at the controller. The water testing cell is provided with a sampling valve for this purpose. Should the test of this sample confirm that a correction of the pool chlorine level is required, this information is simply input by means of a single keystroke on the touch screen of the TEC 3000 controller.

Only three touch screen keys are displayed for each of the two controlled parameters: increase (▲), decrease (▼) and desired value achieved (OK). All that the operator has to do after testing the sample from the water testing cell is to indicate whether the value of the parameter needs to increase, decrease or is correct by pressing the appropriate key. No further input is required – **the TEC 3000 learns and does the rest.**

Being an intelligent controller it recognises patterns in the pool to which it is installed. As a consequence of this, it can also recognise when the information given by the operator is being contradicted by the data collected from its own probes.

This can happen, for instance, if as a result of incorrect poolside water testing, the controller is instructed to increase the chlorine level in the pool despite the evidence from its probes that the level is already at the set point. A conventional controller would blindly increase the dose of chlorine chemical. **The TEC3000 will countermand the erroneous instruction and maintain the chlorine level at the correct value.**

Standardisation and calibration are automatically adjusted after each key press. This means that the system does not have to be frequently standardised or recalibrated.

Controlled dosing of the appropriate chemical also occurs automatically after each key press. The rate of response from the probes is learnt by the controller after the dosing of the chemicals. The rate of dosing of reagents is accurately and intelligently adjusted by the TEC3000

The TEC 3000 parameters are programmed during commissioning, and are tailored to the specific pool. These include pool volume, turnover, types and concentration of chemicals being dosed and dosing pump sizes.

The TEC 3000 is commonly used to dose a chlorine or bromine disinfectant, but peroxide based disinfectants can also be accommodated. As an option, the TEC 3000 can also be used to control the Redox value of the pool water. The pool pH is usually accommodated by a dosing of acid or alkali, as appropriate.

The TEC3000 has many built in safety features: for instance, the TEC 3000 automatically stops dosing if the water flow through the water test cell ceases. If the set point of a parameter has not been achieved after a given time has elapsed, then the pump is stopped.

The TEC3000: an energy saver

Filter pumps installed in swimming pools are generally oversized because they are available in standard pump sizes only. The pump selected is generally going to be larger than the exact requirement of the system.

This means the pool will operate at a higher turnover rate than required for effective water treatment. This wastes energy.

To avoid this, the filter pump can be installed with an external inverter controlled by the TEC3000 to vary its pumping speed, thus optimising the energy consumption.



The TEC3000 can be set up to control the pump speed and vary it to maintain a constant chlorine level in the pool. Therefore if the pool loading is extremely low or there are no bathers present, the water turnover rate can be reduced without compromising water quality, but saving a great deal of energy.

In fact, the equipping of a municipal pool with an inverter and a TEC3000 system could pay for itself within two to three years purely on the energy savings alone.

The TEC3000: quality construction

The TEC3000 is manufactured in the UK using high grade materials and components. It is designed to be robust and remain accurate under normal plant room conditions.

The solid state electronic controller is fitted with a colour touch screen display. Each controller is equipped with analogue and digital inputs and outputs. Operator inputs are via the touch screen.

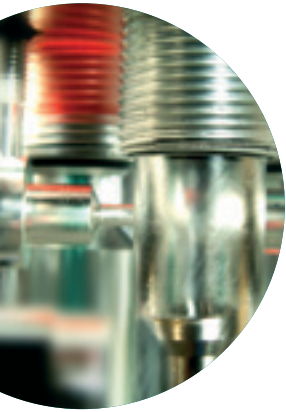
The standard water testing cell is installed with a red chlorine probe, which is an amperometric cell comprising of a silver to silver chloride reference electrode and a platinum working electrode encased in a potassium chloride gel. The black pH probe has a silver to silver chloride reference electrode and an industrial standard pH electrode. Amperometric cells are far less susceptible to the effects of fouling, this allows the TEC 3000 to auto-compensate for fouling of the two measurement electrodes. Many systems do not have this facility, making it necessary to clean the electrodes frequently.

An optional Redox monitoring probe is available.

The controller and water testing cell is supplied factory mounted on an acrylic backboard for ease of installation.

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TEC3000: Technical Data

Dimensions	365mm wide x 500mm tall x 100mm deep
Power Requirement	240 VAC single phase 50 Hz.
Power Consumption	15 watts (Excluding Feeders)
Operating Temperature	0 - 50 degrees centigrade
Enclosure	Plastic IP54
Front control panel	Polyester membrane
Display	Touch screen
Chlorine sensor	Amperometric 3 electrode system Measuring range 0 - 40 mg/l
pH sensor	Standard industrial pH probe Measuring Range 0-14 pH
Outputs	Chemical feeders 2 x 240 VAC switched BMS 0-10V
Inputs	3 analogue 1 digital flow sensor

TEC3000: Available options

- Text faults to a PC or mobile phone.
- Redox probe monitoring.
- Stop dosing if chemical tanks are empty.
- Energy saving inverter control system.
- Dosing pumps, tanks, valves and agitators.
- Operation with peroxide disinfectant

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